Hydric Soils

Watonwan County, Minnesota

[This report lists only those map unit components that are rated as hydric. Dashes (---) in any column indicate that the data were not included in the database. Definitions of hydric criteria codes are included at the end of the report]

Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
8B:					
Sparta loamy sand, 1 to 6 percent slopes	Sparta	90	Outwash plains	No	---
	Darfur	5	Drainageways	Yes	2B3
	Litchfield	5	Outwash plains	No	---
27A:					
Dickinson fine sandy loam, 0 to 2 percent slopes	Dickinson	90	Outwash plains	No	---
	Darfur	5	Drainageways	Yes	2B3
	Linder	5	Outwash plains	No	---
27B:					
Dickinson fine sandy loam, 2 to 6 percent slopes	Dickinson	90	Outwash plains	No	---
	Darfur	5	Drainageways	Yes	2B3
	Linder	5	Outwash plains	No	---
31F:					
Storden loam, 20 to 35 percent slopes	Storden	90	Hills, Moraines	No	---
	Clarion	5	Moraines	No	---
	Delft	5	Drainageways	Yes	2B3
35:					
Blue Earth mucky silt loam	Blue Earth	90	Depressions, Lakebeds (relict)	Yes	2B3, 3
	Canisteo	5	Rims	Yes	2B3
	Muskego	5	Lakebeds (relict)	Yes	1, 3
41B:					
Estherville sandy loam, 1 to 6 percent slopes	Estherville	90	Outwash plains	No	---
	Biscay	5	Drainageways	Yes	2B3
	Linder	5	Outwash plains	No	---

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Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
69B:					
Fedji loamy fine sand, 1 to 6 percent slopes	Fedji	90	Outwash plains	No	---
	Clarion	5	Moraines	No	---
	Webster	5	Drainageways	Yes	2B3
84:					
Brownton silty clay loam	Brownton	90	Depressions, Flats, Lake plains, Rims	Yes	2B3
	Okoboji	10	Depressions	Yes	2B3, 3
86:					
Canisteo clay loam	Canisteo	90	Depressions, Flats, Moraines, Rims	Yes	2B3
	Clrippin	5	Rises	No	---
	Glencoe	5	Depressions	Yes	2B3, 3
101B:					
Truman silt loam, 1 to 4 percent slopes	Truman	90	Hills, Lake plains	No	---
	Madelia	5	Drainageways	Yes	2B3
	Bold	3	Lake plains	No	---
	Spicer	2	Rims	Yes	2B3
102B:					
Clarion loam, 1 to 4 percent slopes	Clarion	90	Hills, Moraines	No	---
	Storden	5	Moraines	No	---
	Webster	5	Drainageways	Yes	2B3
112:					
Harps clay loam	Harps	90	Depressions, Moraines, Rims	Yes	2B3
	Clrippin	5	Rises	No	---
	Glencoe	5	Depressions	Yes	2B3, 3

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Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
113:					
Webster clay loam	Webster	90	Flats	Yes	2B3
	Nicollet	5	Moraines	No	---
	Normania	5	Moraines	No	---
114:					
Glencoe clay loam	Glencoe	90	Depressions, Moraines	Yes	2B3, 3
	Canisteo	5	Rims	Yes	2B3
	Harps	3	Rims	Yes	2B3
	Revere	2	Rims	Yes	2B3
118:					
Crippin loam	Crippin	90	Moraines, Rises	No	---
	Clarion	4	Moraines	No	---
	Canisteo	3	Rims	Yes	2B3
	Swanlake	3	Moraines	No	---
128A:					
Grogan silt loam, 0 to 2 percent slopes	Grogan	90	Outwash plains	No	---
	Madelia	10	Drainageways	Yes	2B3
128B:					
Grogan silt loam, 2 to 6 percent slopes	Grogan	90	Outwash plains	No	---
	Madelia	10	Drainageways	Yes	2B3
130:					
Nicollet loam	Nicollet	90	Moraines, Rises	No	---
	Webster	4	Drainageways	Yes	2B3
	Canisteo	3	Rims	Yes	2B3
	Clarion	3	Moraines	No	---

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Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
134:					
Okoboji silty clay loam	Okoboji	90	Depressions, Moraines	Yes	2B3, 3
	Webster	4	Drainageways	Yes	2B3
	Canisteo	3	Rims	Yes	2B3
	Spicer	3	Rims	Yes	2B3
136:					
Madelia silty clay loam	Madelia	90	Flats, Lake plains	Yes	2B3
	Kingston	5	Lake plains	No	---
	Okoboji	5	Depressions	Yes	2B3, 3
140:					
Spicer silty clay loam	Spicer	90	Flats, Lake plains	Yes	2B3
	Kingston	5	Lake plains	No	---
	Okoboji	5	Depressions	Yes	2B3, 3
160:					
Fieldon loam	Fieldon	90	Flats, Outwash plains	Yes	2B3
	Dassel	4	Depressions	Yes	2B3, 3
	Canisteo	3	Rims	Yes	2B3
	Webster	3	Drainageways	Yes	2B3
178:					
Granby loamy sand	Granby	90	Depressions, Outwash plains	Yes	2B2, 3
	Dassel	5	Depressions	Yes	2B3, 3
	Litchfield	5	Outwash plains	No	---

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Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
181:					
Litchfield loamy fine sand	Litchfield	90	Outwash plains	No	---
	Darfur	5	Drainageways	Yes	2B3
	Sparta	3	Outwash plains	No	---
	Dassel	2	Depressions	Yes	2B3, 3
183:					
Dassel fine sandy loam	Dassel	90	Depressions, Outwash plains	Yes	2B3, 3
	Darfur	5	Drainageways	Yes	2B3
	Fieldon	5	Rims	Yes	2B3
197:					
Kingston silty clay loam	Kingston	90	Lake plains, Rises	No	---
	Madelia	3	Drainageways	Yes	2B3
	Truman	3	Lake plains	No	---
	Bold	2	Lake plains	No	---
	Spicer	2	Rims	Yes	2B3
222B:					
Lasa loamy fine sand, 1 to 6 percent slopes	Lasa	90	Outwash plains	No	---
	Darfur	10	Drainageways	Yes	2B3
227:					
Lemond loam	Lemond	90	Flats, Outwash plains	Yes	2B3
	Dassel	10	Depressions	Yes	2B3, 3
229:					
Waldorf silty clay loam	Waldorf	90	Flats, Lake plains	Yes	2B3
	Brownton	4	Rims	Yes	2B3
	Kingston	3	Lake plains	No	---
	Okoboji	3	Depressions	Yes	2B3, 3

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Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
247:					
Linder sandy loam	Linder	90	Outwash plains	No	---
	Biscay	4	Drainageways	Yes	2B3
	Dickinson	3	Outwash plains	No	---
	Estherville	3	Outwash plains	No	---
255:					
Mayer loam	Mayer	90	Flats, Outwash plains	Yes	2B3
	Dassel	5	Depressions	Yes	2B3, 3
	Linder	5	Outwash plains	No	---
269:					
Millington clay loam, occasionally flooded	Millington, occasionally flooded	90	Flood plains	Yes	2B3
	Fieldon	10	Rises	Yes	2B3
281:					
Darfur fine sandy loam	Darfur	90	Flats, Outwash plains	Yes	2B3
	Dassel	4	Depressions	Yes	2B3, 3
	Litchfield	3	Outwash plains	No	2B3
	Webster	3	Drainageways	Yes	2B3
282:					
Hanska loam	Hanska	90	Flats, Outwash plains	Yes	2B3
	Dickman	10	Outwash plains	No	---
327A:					
Dickman sandy loam, 0 to 2 percent slopes	Dickman	90	Outwash plains	No	---
	Fieldon	4	Rims	Yes	2B3
	Darfur	3	Drainageways	Yes	2B3
	Hanska	3	Outwash plains	No	---

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Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
327B:					
Dickman sandy loam, 2 to 6 percent slopes	Dickman	90	Outwash plains	No	---
	Fieldon	4	Rims	Yes	2B3
	Darfur	3	Drainageways	Yes	2B3
	Hanska	3	Outwash plains	No	---
336:					
Delft loam	Delft	90	Drainageways, Moraines	Yes	2B3
	Clarion	5	Moraines	No	---
	Clrippin	5	Moraines	No	---
362:					
Millington clay loam, frequently flooded	Millington, frequently flooded	90	Flood plains	Yes	2B3, 4
	Fieldon	10	Rises	Yes	2B3
392:					
Biscay loam	Biscay	90	Flats, Outwash plains	Yes	2B3
	Dassel	5	Depressions	Yes	2B3, 3
	Linder	5	Outwash plains	No	---
421B:					
Ves loam, 1 to 4 percent slopes	Ves	90	Hills, Moraines	No	---
	Webster	10	Drainageways	Yes	2B3
423:					
Seaforth loam	Seaforth	90	Moraines, Rises	No	---
	Storden	4	Moraines	No	---
	Ves	3	Moraines	No	---
	Webster	3	Drainageways	Yes	2B3

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Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
487:					
Hoopeston fine sandy loam	Hoopeston	90	Outwash plains	No	---
	Darfur	5	Drainageways	Yes	2B3
	Dickinson	5	Outwash plains	No	---
517:					
Shandep clay loam	Shandep	90	Depressions, Outwash plains	Yes	2B3, 3
	Darfur	5	Drainageways	Yes	2B3
	Fieldon	5	Rims	Yes	2B3
539:					
Palms muck	Palms	90	Depressions, Moraines	Yes	1, 3
	Canisteo	5	Rims	Yes	2B3
	Glencoe	5	Depressions	Yes	2B3, 3
562:					
Knoke silty clay loam	Knoke	90	Depressions, Moraines	Yes	2B3, 3
	Canisteo	5	Rims	Yes	2B3
	Harps	5	Rims	Yes	2B3
575:					
Nishna silty clay loam	Nishna	90	Flood plains	Yes	2B3
	Coland	5	Flood plains	Yes	2B3
	Millington	5	Flood plains	Yes	2B3
639B:					
Ridgeport sandy loam, 1 to 6 percent slopes	Ridgeport	90	Outwash plains	No	---
	Biscay	4	Drainageways	Yes	2B3
	Linder	3	Outwash plains	No	---
	Mayer	3	Rims	Yes	2B3

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Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
654:					
Revere clay loam	Revere	90	Flats, Moraines	Yes	2B3
	Glencoe	5	Depressions	Yes	2B3, 3
	Okoboji	5	Depressions	Yes	2B3, 3
668:					
Corwith silt loam	Corwith	90	Lake plains	No	---
	Madelia	5	Drainageways	Yes	2B3
	Spicer	5	Rims	Yes	2B3
789B2:					
Grogan-Lasa variant complex, 2 to 6 percent slopes, eroded	Grogan, eroded	50	Outwash plains	No	---
	Lasa, variant, eroded	40	Outwash plains	No	---
	Clarion	5	Moraines	No	---
	Madelia	5	Drainageways	Yes	2B3
789C2:					
Lasa variant-Grogan complex, 6 to 12 percent slopes, eroded	Lasa, variant, eroded	50	Outwash plains	No	---
	Grogan, eroded	35	Outwash plains	No	---
	Clarion	10	Moraines	No	---
	Madelia	5	Drainageways	Yes	2B3
790B:					
Grogan-Dickinson complex, 1 to 4 percent slopes	Grogan	50	Outwash plains	No	---
	Dickinson	40	Outwash plains	No	---
	Darfur	5	Drainageways	Yes	2B3
	Fieldon	5	Rims	Yes	2B3

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Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
887B:					
Clarion-Swanlake loams, 1 to 4 percent slopes	Clarion	50	Hills, Moraines	No	---
	Swanlake	35	Hills, Moraines	No	---
	Webster	10	Drainageways	Yes	2B3
	Canisteo	5	Rims	Yes	2B3
909C2:					
Bold-Truman silt loams, 5 to 12 percent slopes, eroded	Bold, eroded	50	Lake plains	No	---
	Truman, eroded	40	Lake plains	No	---
	Kingston	5	Lake plains	No	---
	Madelia	5	Drainageways	Yes	2B3
920B2:					
Clarion-Estherville complex, 2 to 6 percent slopes, eroded	Clarion, eroded	45	Hills, Moraines	No	---
	Estherville, eroded	35	Hills, Moraines	No	---
	Delft	10	Drainageways	Yes	2B3
	Webster	10	Drainageways	Yes	2B3
920C2:					
Clarion-Estherville complex, 6 to 12 percent slopes, eroded	Clarion, eroded	50	Hills, Moraines	No	---
	Estherville, eroded	35	Hills, Moraines	No	---
	Delft	5	Drainageways	Yes	2B3
	Nicollet	5	Moraines	No	---
	Webster	5	Drainageways	Yes	2B3
921B2:					
Clarion-Storden loams, 3 to 6 percent slopes, eroded	Clarion, eroded	65	Hills, Moraines	No	---
	Storden, eroded	25	Hills, Moraines	No	---
	Delft	5	Drainageways	Yes	2B3
	Webster	5	Drainageways	Yes	2B3

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Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
921C2:					
Clarion-Storden loams, 6 to 12 percent slopes, eroded	Clarion, eroded	65	Hills, Moraines	No	---
	Storden, eroded	25	Hills, Moraines	No	---
	Delft	5	Drainageways	Yes	2B3
	Nicollet	5	Moraines	No	---
929:					
Fieldon-Canisteo complex	Fieldon	50	Flats, Outwash plains	Yes	2B3
	Canisteo	35	Flats, Outwash plains	Yes	2B3
	Clrippin	5	Moraines	No	---
	Dassel	5	Depressions	Yes	2B3, 3
	Shandep	5	Depressions	Yes	2B3, 3
954B2:					
Ves-Storden loams, 3 to 6 percent slopes, eroded	Ves, eroded	50	Hills, Moraines	No	---
	Storden, eroded	30	Hills, Moraines	No	---
	Delft	10	Drainageways	Yes	2B3
	Webster	10	Drainageways	Yes	2B3
954C2:					
Storden-Ves loams, 6 to 15 percent slopes, eroded	Storden, eroded	45	Hills, Moraines	No	---
	Ves, eroded	40	Hills, Moraines	No	---
	Delft	10	Drainageways	Yes	2B3
	Webster	3	Drainageways	Yes	2B3
	Normania	2	Moraines	No	---

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Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
956:					
Canisteo-Glencoe clay loams	Canisteo	60	Depressions, Flats, Moraines, Rims	Yes	2B3
	Glencoe	20	Depressions	Yes	2B3, 3
	Clrippin	10	Rises	No	---
	Nicollet	10	Rises	No	---
960D2:					
Storden-Clarion loams, 12 to 18 percent slopes, eroded	Storden, eroded	50	Hills, Moraines	No	---
	Clarion, eroded	35	Hills, Moraines	No	---
	Delft	10	Drainageways	Yes	2B3
	Nicollet	5	Moraines	No	---
999B2:					
Ves-Estherville complex, 2 to 8 percent slopes, eroded	Ves, eroded	60	Hills, Moraines	No	---
	Estherville, eroded	30	Hills, Moraines	No	---
	Delft	4	Drainageways	Yes	2B3
	Linder	2	Outwash plains	No	---
	Normania	2	Moraines	No	---
	Storden	2	Moraines	No	---
1055:					
Palms-Glencoe complex, ponded	Palms, ponded	50	Depressions, Moraines	Yes	1, 3
	Glencoe, ponded	35	Depressions	Yes	2B3, 3
	Canisteo	10	Rims	Yes	2B3
	Essexville	5	Rims	Yes	2B3
1833:					
Coland clay loam, occasionally flooded	Coland, occasionally flooded	90	Flood plains	Yes	2B3
	Fieldon	10	Rises	Yes	2B3

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Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
1834:					
Coland clay loam, frequently flooded	Coland, frequently flooded	90	Flood plains	Yes	2B3, 4
	Fieldon	10	Rises	Yes	2B3
1907:					
Lakefield silty clay loam	Lakefield	90	Lake plains	No	---
	Spicer	10	Rims	Yes	2B3
1931:					
Essexville sandy loam	Essexville	90	Flats, Moraines	Yes	2B3
	Glencoe	5	Depressions	Yes	2B3, 3
	Canisteo	3	Rims	Yes	2B3
	Lemond	2	Rims	Yes	2B3
L13A:					
Klossner muck, depressional, 0 to 1 percent slopes	Klossner, drained	80	Depressions, Moraines	Yes	1, 3
	Mineral soil, drained	15	Depressions, Moraines	Yes	2B3, 3
	Houghton, drained	5	Depressions, Moraines	Yes	1, 3
L83A:					
Webster clay loam, 0 to 2 percent slopes	Webster	65	Flats, Moraines, Swales	Yes	2B3
	Glencoe, depressional	14	Depressions, Moraines	Yes	2B3, 3
	Canisteo	8	Depressions, Flats, Moraines, Rims	Yes	2B3
	Nicollet	8	Flats, Moraines, Rises	No	---
	Poorly drained soil	5	Flats, Moraines, Swales	Yes	2B3

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Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
L84A:					
Glencoe clay loam, depressional, 0 to 1 percent slopes	Glencoe, depressional	80	Depressions, Moraines	Yes	2B3, 3
	Very poorly drained muck	10	Depressions, Moraines	Yes	2B3, 3
	Canisteo	5	Depressions, Flats, Moraines, Rims	Yes	2B3
	Harps	5	Depressions, Rims	Yes	2B3
L85A:					
Nicollet clay loam, 1 to 3 percent slopes	Nicollet	85	Flats, Moraines, Rises	No	---
	Clarion	10	Hills, Moraines	No	---
	Webster	5	Flats, Moraines, Swales	Yes	2B3
L107A:					
Canisteo-Glencoe, depressional complex, 0 to 2 percent slopes	Canisteo	50	Moraines, Rims	Yes	2B3
	Glencoe, depressional	35	Depressions, Moraines	Yes	2B3, 3
	Harps	9	Moraines, Rims	Yes	2B3
	Canisteo, depressional	3	Depressions, Moraines	Yes	2B3, 3
	Crippin	3	Flats, Moraines, Rises	No	---
L163A:					
Okoboji silty clay loam, depressional, 0 to 1 percent slopes	Okoboji, depressional	92	Lake plains, Moraines	Yes	2B3, 3
	Canisteo	2	Depressions, Flats, Moraines, Rims	Yes	2B3
	Harpster	2	Lake plains	Yes	2B3
	Knoke, depressional	2	Lake plains	Yes	2B3, 3
	Prinsburg	2	Depressions, Flats, Lake plains, Moraines, Rims	Yes	2B3

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Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
L201A:					
Normania loam, 0 to 3 percent slopes	Normania	85	Flats, Moraines, Rises	No	---
	Amiret	7	Hills, Moraines	No	---
	Seaforth	3	Flats, Moraines, Rises	No	---
	Webster	3	Flats, Moraines, Swales	Yes	2B3
	Canisteo	2	Depressions, Flats, Moraines, Rims	Yes	2B3

Hydric Soils

This table lists the map unit components that are rated as hydric soils in the survey area. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 2002).

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2003) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and others, 2002).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The criteria for hydric soils are represented by codes in the table (for example, 2B3). Definitions for the codes are as follows:

1. All Histels except for Folistels, and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
   A. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
   B. are poorly drained or very poorly drained and have either:
      1) a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
      2) a water table at a depth of 0.5 foot or less during the growing season if permeability is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
      3) a water table at a depth of 1.0 foot or less during the growing season if permeability is less than 6.0 in/hr in any layer within a depth of 20 inches.
3. Soils that are frequently ponded for long or very long duration during the growing season.
4. Soils that are frequently flooded for long or very long duration during the growing season.

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